Another important investigation had to do with the movements of lime in the soil. The conditions of solubility were determined, and deductions were drawn which threw important light on the practices of liming and marling, and on the presence of lime in natural waters.

Further, Schlœsing studied the effect on plant growth of the carbon dioxide and ammonia present in the atmosphere, in the soil, and in natural waters. He set up the well-known hypothesis that the proportion of carbon dioxide in the atmosphere is related to the extent of dissociation of the bicarbonates in the sea. The sea was thus regarded as a reservoir which equalises the stock of carbon dioxide in the atmosphere, taking up any excess that might be formed at any time, and supplying any deficit from the average amount should such ever arise.

Schlœsing's best-known work, however, was on nitrification. For a long time it had been known that nitrates are gradually formed when plant or animal residues, farmyard manure, etc., are incorporated in the soil. The process was of much technical importance in the seventeenth and eighteenth centuries as the source of nitrate for gunpowder. During the Thirty Years' War and other great Continental wars the various Governments had been seriously concerned in these so-called nitre beds, and had done a good deal to stimulate their development. The conditions of the change were tolerably well ascertained, but nothing was known as to its mechanism.

It has several times happened in the history of civilisation that agriculture has benefited by knowledge gained during war. The mass of information accumulated during the eighteenth-century wars, and apparently rendered useless in the nineteenth century by the promise of peace and the discovery of nitrates in Chile, was found to be of fundamental importance in agriculture. It was found that the nutrition of plants so far as nitrogen was concerned depended on the nitre-bed processes; organic nitrogen compounds, useless as plant nutrients, when added to the soil became converted into highly valuable nitrates; the more rapidly this change could be brought about, the better for the plant. So long as the mechanism of the change was unknown, the old knowledge was simply empirical and incapable of full utilisation. Many investigations were therefore made, but for years the problem remained unsolved. The balance of opinion was in favour of a purely physical process, but there was also a strongly supported chemical hypothesis.

Schlœsing and Muntz had been working at the formation of nitrates in sewage during the process of nitrification, and they noticed an inert period of twenty days before the commencement of nitrification. With characteristic shrewdness they observed that this delay could scarcely arise if the process were purely physical or chemical; some biological factor seemed to be indicated. In order to test this possibility they added a little chloroform to the sewage; nitrification at once stopped. They then removed the chloroform, and "seeded" with a little fresh sewage; after an interval nitrification began again. This afforded strong evidence that the process was due to living organisms, and in course of time the proof was made more rigid by Winogradsky's isolation of the specific organism.

This research is one of the foundations of modern soil bacteriology, and for this alone Schlœsing would be remembered. But his other work has also played an important part in the development of the subject, and he may justly be regarded as a worthy successor to the great Boussingault, whom he followed at the Conservatoire des Arts et Métiers in 1887. He carried on the high standard set by his predecessor, and leaves a name that will long be held in high honour and esteem.

E. J. Russell.

NOTES.

The Prime Minister's list of New Year honours, the publication of which has been delayed by circumstances arising out of the armistice, was issued on Monday, and includes the following names of workers in scientific fields:—*Baronet:* Dr. Norman Moore, president of the Royal College of Physicians. *Knights:* Mr. R. T. Blomfield, past president of the Royal Institute of British Architects; Lt.-Col. J. M. Cotterill, C.M.G., consulting and late acting surgeon, Edinburgh Royal Infirmary, and lecturer in clinical surgery, Edinburgh School of Medicine; Prof. Israel Gollancz, secretary of the British Academy since its foundation; Prof. R. A. Gregory, chairman of the Organising Committee, British Scientific Products Exhibition; Mr. H. J. Hall, organiser under the Ministry of Munitions of the section dealing with the production of fertilisers; Dr. Edward Malins; Mr. J. H. Oakley, president of the Surveyors' Institution; Prof. W. Ridgeway, professor of archæology, University of Cambridge; Dr. C. S. Tomes, F.R.S.; and Dr. T. J. Verrall, chairman of the Central Medical War Committee.

The joint meeting of the Faraday Society and the Röntgen Society, held at the Royal Society on Tuesday for the discussion of "The Examination of Materials by X-rays," afforded remarkable testimony to the wide interest taken in the opportunity which such a meeting provides of bringing together theoretical knowledge and practical experience of a scientific subject. The meeting-room of the Royal Society was crowded, and one twice the size could easily have been filled. The discussion, of which we shall give an account in a later issue, began in the afternoon, and was continued in the evening after adjournment for dinner, to which a large company was invited by the president of the Faraday Society, Sir Robert Hadfield. It was an unusual privilege for the Royal Society to grant the use of its meeting-room for a discussion organised by other societies, but there could not be a more appropriate place for such a meeting, and the society itself might with advantage arrange for similar meetings at which all scientific workers in wide fields are actively interested. The success of the Faraday Society discussions is due chiefly to the rare combination of pure and applied science and unbounded energy manifest in Sir Robert Hadfield, and to the untiring work of the secretary of the society, Mr. F. S. Spiers. It was particularly pleasing to note the number of the younger generation of scientific workers present at the meeting. No more encouraging sign could be given of the vitality of British science, and we trust that the Faraday Society will be strengthened greatly by increase of membership to continue its valuable work of co-ordinating scientific activities. The address of the society is 82 Victoria Street, Westminster, S.W.1.

Unfavourable weather has as yet delayed the trans-Atlantic flight, and the aeroplanes, although perfectly ready for the start eastwards, have still to wait for weather conditions which, at all events, will give them some chance of success in their attempt at crossing. There are few days in the course of the year when the whole passage from Newfoundland to Europe is quiet and favourable to the safe passage of aeroplanes. May and June are probably as favourable as any time throughout the year for settled and favourable weather conditions, but this does not mean that such favourable conditions occur in these months every year. At this season there is commonly at times a large amount of easterly wind. On an average there are fewer gales in the North Atlantic, and if storms develop they are of less intensity than at other seasons. In mid-Atlantic fog is most prevalent during the summer season, but an aeroplane would be well above this, although it would prevent passing vessels being seen. In Newfoundland fogs are more prevalent at St. John's than on the north-east coast, the latter part being peculiarly free from fog throughout the year. On our own coasts fogs are most prevalent in the winter. For the last week there can be no doubt about the stormy character of the weather, and the conditions throughout the route have become less favourable than in the preceding week; from this it must not be understood that the conditions have been sufficiently settled for the flight since the aeroplanes have been ready. The heavy snowstorm and gale over England on Sunday last sufficiently illustrate the suddenness of our weather changes. The Air Ministry in its bulletin issued on the evening of April 28 said: "Strong northerly winds, with squalls and much low cloud to the westward of Ireland, continue to render the conditions unsuitable for the flight."

An excellent summary of the work of our Air Services has been issued as a Parliamentary paper under the title "Synopsis of British Air Effort during the War," and was reprinted in the *Times* of April 24. The enormous growth of the Air Force is illustrated by figures, and an idea of the extent of its activities may be gained from the fact that on the Western front, between July, 1916, and Armistice Day, more than 7000 enemy machines were brought down, nearly 7000 tons of bombs dropped, 10½ million rounds fired at ground targets, and 900,000 flying hours completed. The aid of the man of science has been called for in many ways, apart from the fundamental investigations of aerodynamics and the principles of flight. Examples of this may be found in such important work as the design of oxygen apparatus and electrically heated clothing for use at great altitudes. Photography, again, has played a marvellous part, as may be gathered from the statement that in a single month more than 23,000 negatives were made and 650,000 prints issued. The photographic branch has now 250 officers and 3000 other ranks, and it is estimated that no fewer than five million prints of aerial photographs have been issued by the Air Services in the field. Another great sphere of scientific activity has opened out in connection with the application of wireless telegraphy to aircraft; and this branch of the Service, which was in its infancy in 1914, now possesses 520 officers and 6200 other ranks, numbers which testify to the great progress made. Never before in history has science been so widely and effectively employed as during the recent struggle, and the Air Services alone afford an example which should establish for ever the great value of organised scientific research.

A snowstorm of unusual severity for so late in the season occurred generally over the British Isles on Sunday, April 27, and in the south-east of England the storm was particularly severe. On the morning of Sunday a subsidiary disturbance was developing over the northern portion of the kingdom, and it afterwards moved southwards and eastwards over England, the parent disturbance being centred over Denmark. By the evening the subsidiary had assumed more serious proportions than the primary to the north-eastward, and was now centred over London and the south-east of England. Snow or hail fell in all districts of the United Kingdom. A region of high barometer extended from Iceland to the Azores which caused strong northerly winds in the rear of the disturbance, and gale force was reached in all districts, whilst at Holyhead the wind force attained the velocity of seventy miles per hour during Sunday night. In London snow commenced at about 1 p.m. after somewhat heavy rain, and it thoroughly covered the ground by 3 p.m. The depth of snow by the early morning of April 28 in the north of London was 12 in. to 15 in., and the total precipitation in the twenty-four hours was 1·6 in. at Camden Square and 1·7 in. at Hampstead. The snowfall occasioned much dislocation of the telegraph and telephone services, and the rapid melting of the snow caused floods in many parts. Temperature on April 27 was abnormally low for so late in the season, the thermometer in London during the afternoon standing at about freezing point. Agriculturists and fruit-growers have suffered somewhat badly.

A new expedition to the Antarctic is announced to sail in June, 1920. It will be known as the British Imperial Antarctic Expedition, and will be under the leadership of Mr. J. L. Cope, who accompanied the Ross Sea party of the recent Imperial Antarctic Expedition, 1914–17, as surgeon and naturalist. Mr. Cope's plans are ambitious and cover a wide area. Primarily, he aims at ascertaining the position and extent of minerals of economic value in Antarctica, and, by observations on the distribution and migration of whales, to foster the British whaling industry. It is understood that his plans include a base at New Harbour, in Victoria Land, and a wintering party in the middle of the Ross Barrier, mainly with a view to meteorological and magnetical observations. The ship itself, which is to be the *Terra Nova*, a vessel of proved capacity for Antarctic work, will spend the second winter at or around Cape Ann, in Enderby Land. Since that is a part of Antarctica which is practically unknown, a wintering party cannot fail to achieve results of great value. It is proposed to make use of an aeroplane for survey work and facilitating the choice of a route for sledge journeys. It is hoped that by this means Mr. Cope will be able to map the missing coast-line between Enderby Land and Wilkes Land to the east, and between Enderby Land and Coats Land to the west. Later it is proposed to follow the coast of Antarctica from Graham Land to Edward Land. The expedition is expected to last for six years, during which time communication with civilisation will be kept up by wireless telegraphy. While the plans, so far as announced, seem sound and likely to result in valuable discoveries, Mr. Cope might perhaps be well advised to curtail the duration of the expedition by at least two years. In any case, it is practically certain that his ship will require to dock for overhaul and minor repairs after two or three years among the ice.

The Indian Public Works Department has lost a zealous and capable administrator by the death of Mr. George Thomas Barlow, Chief Engineer and Secretary in the Irrigation Branch of the United Provinces Government. Mr. Barlow's connection with irrigation work in northern India had been long and honourable, dating back in unbroken sequence to the year 1887, when he went out to India after a course of technical training at Coopers Hill, followed by a year of practical engineering work in Scotland. From that time until his death he was continuously engaged on irrigation schemes, at first at various posts on the Ganges, and afterwards, from 1901, in Bundelkund, a trans-Jumna tract of the United Provinces, where he was executive engineer on a considerable number of undertakings for ameliorating drought-stricken areas. Under Mr. Barlow's direction many surveys of different localities were made, numerous reservoirs constructed, and large masonry dams and canals brought into existence. He was promoted Superintending Engineer in 1911, and received the C.I.E. for his services in 1915. The following year he was appointed Secretary to the Government in the Irrigation Branch, and so recently as last October he was placed on deputation with Mr. Meares to undertake a systematic hydro-technical survey of the whole country. He was engaged in these researches up to the time of his death. Mr. Barlow was the author of several text-books dealing with irrigation work.

The death of Mr. A. McHenry, which occurred somewhat suddenly on April 19, removes one of the oldest and most assiduous workers from the field of Irish geology. For more than forty years Mr. McHenry was on the staff of the Geological Survey, and the first mapping of some of the difficult areas in the north-west of Ireland fell to his share. He was always responsive to new discoveries, and was as enthusiastic in the revision of Silurian rocks by their graptolitic zones as in tracing thrust-planes and possible inversions of succession. His warm-hearted and unselfish character has left an enduring memory from days when controversies were not always conducted with such marked generosity and consideration. The Memoirs of the Geological Survey of Ireland contain ample evidence of his original observations. In addition, Mr. McHenry was the first to point out how the succession of intrusive igneous rocks in the Mourne Mountains corresponds with the volcanic episodes farther north, and he has left behind him unpublished records which may prove to be of considerable service in the elucidation of the problem of the Dingle series.

The task imposed on industries by the war was the production in quantity of accurately standardised products. To ensure the successful development of peace-time trade, the high standard of accuracy and quality thus set must be maintained, and this is possible only by the institution in each factory of a system of inspection similar to that in operation during the war. Particulars have reached us of a new organisation, called the Technical Inspection Association, which has been formed recently for this purpose. There are doubtless many private firms which desire to set up a system of inspection in order to ensure interchangeability and uniform quality of these products. Such firms will be interested in the new association. The objects of the association are to keep members of the inspection staff of the Ministry of Munitions in close touch with each other, and to develop generally the progress and standardisation of methods of inspection in engineering, chemical, and allied industries with the view of conserving and co-ordinating the experience gained during the war for national use. The work will thus be of considerable scientific interest as well as industrial value. The temporary address of the association is Hotel Metropole, Northumberland Avenue, London, S.W.1.

We regret to record the death of Mr. Wilfred James Lineham at Brighton on April 22. Mr. Lineham, who was sixty years of age, was well known as a teacher of engineering and as an author of engineering textbooks. He was connected with the Goldsmiths' College for thirty years, and was formerly on the staff of the Armstrong College, Newcastle-on-Tyne. He took an active part in the founding of the Association of Teachers in Technical Institutes, and for many years was a member of the engineering faculty of London University. Mr. Lineham was a member of the Institutions of Civil Engineers, Mechanical Engineers, and Electrical Engineers. During the war a great deal of munition work was carried on at the Goldsmiths' College, and there is little doubt that Mr. Lineham's death was accelerated by the heavy work entailed thereby. It is of interest to note that he was an artist, and had exhibited at the Royal Academy. He had many friends, both amongst practical engineers and teachers, and his loss will be deeply regretted.

The seventy-second annual meeting of the Palæontographical Society was held at the rooms of the Geological Society, Burlington House, on April 25, Dr. Henry Woodward, president, in the chair. The council's report announced the completion of the seventy-first volume of monographs, with instalments of Wealden and Purbeck fishes, Pliocene Mollusca, Cambrian Trilobites, and Palæozoic Asterozoa. Mr. Henry Dewey, Dr. F. L. Kitchin, Mr. W. P. D. Stebbing, and Mr. Henry Woods were elected new members of council. Dr. Henry Woodward, Mr. Robert S. Herries, and Dr. A. Smith Woodward were re-elected president, treasurer, and secretary respectively.

The death is announced of Dr. Fernand Priem, honorary professor of geology in the Lyceum of Henri IV., and correspondant of the National Museum of Natural History, Paris. Dr. Priem was born on November 10, 1857, at Bergues, near Dunkerque, and studied palæontology under the late Prof. Albert Gaudry. He made many notable contributions to our knowledge of fossil fishes, among which may be specially mentioned his memoir on the fossil fishes of the Paris basin, published separately by the *Annales de Paléontologie* in 1908, and his description of new Cretaceous fishes from Persia included in the report of the Mission de Morgan in the same year

The annual British Academy lecture on a master mind (Henriette Hertz Trust) will this year have as its subject "Leonardo da Vinci," and be delivered by Mr. C. J. Holmes, director of the National Gallery, in the rooms of the Royal Society on Friday, May 2, at five o'clock, this being the anniversary of the death of Leonardo da Vinci. Sir Frederic Kenyon, president of the British Academy, will be in the chair.

Dr. Winifred Cullis and Miss Mona Wilson have accepted membership of the Industrial Fatigue Research Board, recently appointed by the Department of Scientific and Industrial Research and the Medical Research Committee jointly to study questions of industrial fatigue.

Sir Hugh Charles Clifford, Governor of the Gold Coast, has been appointed Governor and Commander-in-Chief of the Colony and Protectorate of Nigeria, in succession to Sir Frederick Lugard, who will retire from the Colonial Service in July.

Sir J. G. Frazer contributes to the March issue of *Man* a note by Rai Bahadur K. Ranga Achariyar on the customs of the Todas in connection with the milk of their sacred dairies. In relation to the Hebrew prohibition against seething a kid in its mother's milk, Sir J. G. Frazer has discussed milk taboos in his recent work, "Folk-lore in the Old Testament" (vol. iii., pp. 111 ff.). But all the taboos on the dairy and the milk are meant only for the well-being of the Todas primarily and of the buffaloes secondarily. There is not the slightest trace among them of the belief that the restrictions are in the interests of the buffaloes or for their benefit, or that there is a magical sympathy between the cows and their milk. The parallel between the Toda and Hebrew customs is thus not clearly established, but the facts now fully reported for the first time are of considerable interest.

In *Science* for March 7 and 14, under the title of "The Measurement and Utilisation of Brain-power in the Army," there is a very interesting and valuable synopsis of the work of the American Psychological Section of the Army, which has been under the direction of Major R. M. Yerkes. Within the Army three principal groups of psychologists are recognised: one attached to the office of the Adjutant-General, another to the office of the Surgeon-General, and the third to the division of Military Aeronautics. At first the psychologist was looked upon sceptically, and his *rôle* was supposed to be to assist in the elimination of incompetent neurotics; later, the psychological service was undertaking the assignment of an intelligence rating to every soldier, the selection of men of superior intelligence for special suitable tasks, and the discovery of the intellectually unfit. Very careful tests were chosen, and it became possible ultimately for four psychologists and their attendant clerks to examine one thousand men a day. To supply the necessary *personnel* a school for training in military psychology had to be formed. Although at first even the psychologists were critical about accepting the intelligence rating as a standard of military efficiency, yet as the work progressed it was found that it was the best single factor by which to determine a man's military value. Students of similar intelligence were grouped together for training, thus facilitating the speed and success of the work. It is interesting to note that of all the occupations in the Army the engineering sections contained fewer men of low or mediocre intelligence. It is suggested in the paper that, with suitable modifications, this psychological testing might prove advantageous to problems of civil life.

Sir Edward Sharpey Schafer devoted his presidential address to the Edinburgh University Physiological Society last January to the consideration of "The Position of Physiology in Medicine." He showed that it is "the pivotal subject around which all medical sciences are centred, and furnishes the basis upon which the whole of medicine and surgery is founded." While there can be no doubt that the practice of learning physiology before commencing the study of what is founded upon it is correct, yet it is difficult to convince the student of the importance of what he is taught. He is apt to look upon it merely as an examination subject to be forgotten as soon as the test is passed. For this reason it would seem that there might be some advantage in allowing the student to see something of hospital work at the commencement of his physiological studies. A very short, properly planned, special course would suffice if the interest of the hospital staff could be enlisted This should be less difficult since the importance of physiology has become so manifest in the war. It is pointed out by Sir Edward Schafer that clinical teaching should be in the hands of those who have a thorough knowledge of physiology, whereas it is comparatively rare to find a medical man who realises how dependent he is on physiological work. It is also strongly insisted upon in this address that practical work is of the greatest importance in the proper understanding of the subject, notwithstanding its cost in apparatus, buildings, and staff. This leads naturally to the emphasising of the vital necessity of generous aid to universities on the part of the State.

Some details of British survey work on the Western front are given by Lt.-Col. H. S. L. Winterbotham in the *Geographical Journal* for April (vol. liii., No. 4). The field survey department grew with the growth of the armies and the new methods of warfare, and managed to meet all the requirements of infantry, artillery, and air force. The existing maps at the beginning of the war were the French 1/80,000, and the plans around fortresses of 1/20,000. In addition, there was a survey on a scale of 1/2500, which was originally made for revenue purposes, and kept in manuscript in the capital of each province: some of these were captured by the Germans early in the war. When trench warfare set in the necessity for a new and accurate large-scale map became apparent. Col. Winterbotham describes some of the difficulties which had to be faced in compiling this map. There was no lack of trigonometrical matter, but it was not easy to reconcile the five systems in existence. The old French triangulation was found to have many defects, not the least being that many of the original fixed points had been destroyed. The Belgian triangulation was perhaps more accurate, but it suffered from the same drawback as regards fixed points. In addition, there were the French Admiralty Survey for the coast, the cross-Channel chain of triangulation made more than fifty years ago, and the new French chain on the Paris meridian and the Amiens parallel. This last survey was connected with the Belgian system with useful results. Difficulty was also experienced in reconciling different data of levels. Col. Winterbotham's paper concludes with some description of how the map was made, and certain other activities of the field survey battalions.

The Decimal Association has issued a reprint of Mr. Harry Allcock's article on "Industrial Reconstruction and the Metric System" which appeared in the *Electrical Review* of January 17. This is a very able exposition of the case for the compulsory adoption of the metric system of weights and measures. The author urges that, in order to prepare public opinion for the new system, the Government should extend the practice adopted in 1913, when the metric carat was prescribed as the standard weight for precious stones, and abolish forthwith all apothecaries' weights in favour of metric weights throughout the trade in fine chemicals and drugs. Many of the multiples of existing British units should, he maintains, be at once discarded, and all quantities be expressed in terms of single units instead of in cwts., qrs., lbs., etc. As regards the argument that until they became expert in the use of the metric system British manufacturers and merchants would be at a disadvantage as compared with similar classes in Germany, Mr. Allcock points out that this temporary handicap must be faced sooner or later, and that it would be peculiarly opportune to face it now, while the sentiment of the world is decidedly anti-German.

A new ferrous alloy with remarkable properties is mentioned in the *Scientific American* for March 1.

The composition appears to be approximately 60 per cent. nickel, 14 per cent. chromium, a little molybdenum, and the remainder iron. It is melted in crucibles and poured into sand moulds. Its tensile strength at air-temperature is 50,000 lb. per sq. in., while at 1800° F. it is still 30,000 lb. It melts at 2800° F., and withstands repeated heatings to 1800° F. and coolings without serious oxidation or diminution of strength. It works well, and can be drawn into wire. It is not acted on by chemicals even when heated, and is already being freely used for the valves and valve-seats of internal-combustion engines and for domestic utensils. The possibility of using the alloy in place of plumbago for crucibles is under investigation, and the results so far obtained are most encouraging. The field of usefulness of an alloy with these properties is obviously extensive, and it is unfortunate that the *Scientific American* gives no hint as to where the material can be obtained.

In the Proceedings of the Indian Association for the Cultivation of Science (vol. iv., part ii., 1918) Mr. S. Banerji deals with the vibrations of elastic shells partly filled with liquid. The problem here considered is chiefly of acoustical interest in relation to the theory of "musical glasses." This class of instrument consists of a series of thin-walled elastic shells the gravest modes of vibration of which are tuned to form a musical scale by partially filling them with a liquid, and are excited either by striking or by tangential friction on the rims. The principal features of interest requiring elucidation are (*a*) the dependence of the pitch of the vibration upon the quantity of liquid contained in the vessel, and (*b*) the mode of vibration of the liquid itself. These features are discussed in this paper for the three cases in which the elastic shell is respectively (1) a hemispherical one, (2) a cylindrical one with a flat bottom, and (3) a conical cup, these forms approximating more or less closely to those used in practice. The analytical expressions show that the motion of the liquid is very marked near the margin of the vessel, but is almost imperceptible near the centre and at some depth inside the liquid. Numerical results have also been obtained and tabulated, and the graphs plotted, showing the theoretical relations between the quantity of liquid in the vessel and the vibration frequency. The lowering of pitch due to addition of liquid is greatest when the vessel is nearly full.

MESSRS. BERNARD QUARITCH, LTD., 11 Grafton Street, W.1, have just issued a Catalogue (No. 352) of second-hand books and periodicals which they have for disposal. The 1700 odd works listed range over many branches of literature, but the sections relating to natural history and periodicals and transactions of learned societies will appeal more especially to readers of NATURE. In them we notice a set, with supplement, of Gould's "The Birds of Australia," Elwes and Henry's "The Trees of Great Britain and Ireland," Sargent's "The Sylva of North America: A Description of the Trees which Grow Naturally in North America exclusive of Mexico," Butler's "Illustrations of Typical Specimens of Lepidoptera Heterocera in the Collection of the British Museum," R. Bowdler Sharpe's "Hand-list of the Genera and Species of Birds," Edwards's "The Botanical Register" (a set), and long runs of the *Berichte* of the Deutsche Chemische Gesellschaft, the *Quarterly Journal of Microscopical Science*, and the Proceedings and Transactions of the Zoological Society of London. The catalogue is published at 1*s*.

THE following books of science and education are announced for early publication:—"Euclid in Greek" (Book i.), Sir T. L. Heath, and "A Short History of Education," Prof. J. W. Adamson (*Cambridge University Press*); "Practical Vaccine Treatment for the General Practitioner," Dr. R. W. Allen (*H. K. Lewis and Co., Ltd.*); "George Westinghouse: His Life and Achievements," F. E. Leupp (*John Murray*); "Scientific Factory Management," Dr. A. D. Denning (*J. Nisbet and Co., Ltd.*); "Gas and Oil Engine Operation," J. O'Kill (*Sir Isaac Pitman and Sons, Ltd.*).

OUR ASTRONOMICAL COLUMN.

THE APRIL METEORS OF 1919.—Observations were obtained at Bristol on the nights of April 18, 20, 21, and 22, but the display was by no means a rich one. The night of chief activity was April 21, when fourteen meteors were recorded between 8h. 40m. and 11h. 35m. G.M.T. Of these, nine were Lyrids and indicated a radiant point at $272^\circ+30^\circ$. Several fine meteors were observed on this night, and particularly at 9.30 and 9.40 G.M.T. The first of these appeared as bright as Sirius, and slowly floated from $236^\circ-1\frac{1}{2}^\circ$ to $246^\circ-2^\circ$ in about 5 secs. This must have been a fine object as seen from the eastern counties of England. The second was one of the true April meteors, with a bright streak, and moved swiftly from $297^\circ+65^\circ$ to $31^\circ+47\frac{1}{2}^\circ$. It was of about the same apparent magnitude as Jupiter.

THE METEORIC SHOWER OF HALLEY'S COMET.—The celebrated comet of Halley has an accompanying meteor system. The shower was discovered in 1870 by Capt. G. L. Tupman, and shown by Prof. A. S. Herschel, a few years later, to exhibit a significant resemblance to the cometary orbit. The meteors are visible in the mornings of the first week in May, and their flights are directed from a point near the equator in R.A. 337° in Aquarius, and close to the stars ζ and η in that constellation. The meteors have not been witnessed in the same splendour and abundance as those of November from Tempel's and Biela's comets, but they are individually very fine objects, traversing long paths extending occasionally over half the visible firmament, and worthy representatives of the notable comet from which they are derived.

The reappearance of this shower is now due, and it is very desirable that a watch for its meteors should be maintained on the next few mornings. We want more data with regard to its duration, whether or not the point of radiation moves eastwards, like that of the Perseids, and what annual differences affect the number of meteors appearing. Double observations of identical objects will be valuable as enabling their heights and velocities to be determined. The materials already acquired affirm that the observed motion is decidedly slower than that implied from theory, and this is probably due to the resistance of the atmosphere. The radiant does not rise until the morning twilight is in evidence, and when a short period only remains available for observation.

Heis, so far back as May 2, 1848, witnessed a rich display of streaking meteors, and this may quite possibly have been an early return of this system.

OCCULTATION OF STARS BY VENUS.—Mr. Arthur Burnet, honorary secretary of the Leeds Astronomical Society, who has achieved success previously in predicting phenomena of this kind, writes to us from France that the stars 79 Leonis, magnitude 5·5, and B.D.+2·2422°, magnitude 8·6, No. 6927 in the d'Abbadia Catalogue (1900), will be occulted by the planet Venus on August 1 next as seen from certain places in the southern hemisphere. Geocentric conjunction of the planet with 79 Leonis will take place on August 1d. 8h. 54m. G.M.T., and the occultation may be seen from South America. Mr. Burnet computes that the duration of the occultation as seen from Rio de Janeiro will be about nine minutes.